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(54) Operation of an alarm system

(57) In a motor vehicle alarm system with a central controller 3 connected to a plurality of controllers 5, 6 of the motor vehicle, all non-safety-related controllers of the motor vehicle are connected bidirectionally to the central controller, a particular code for the respective activation of the alarm system being stored in the non-safety-related controllers and being able to be read out there. On the replacement of controllers, the new controllers are, on start-up of the vehicle, activated in the original sense by the controllers not replaced. If the alarm system is deactivated improperly, at least some of the non-safety-related controllers are deactivated or influenced negatively as regards their mode of operation.

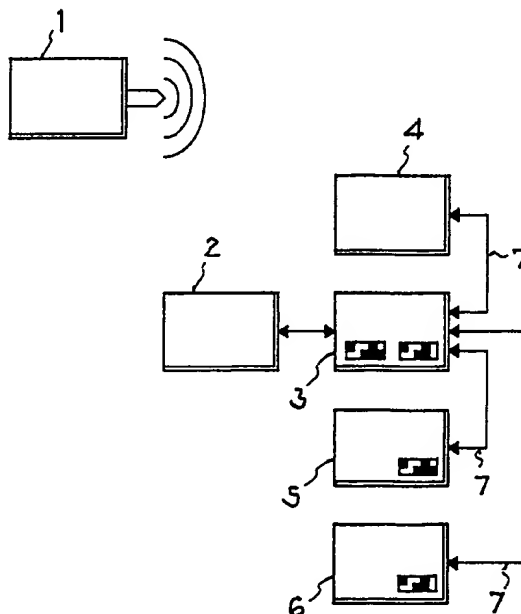


FIG.1

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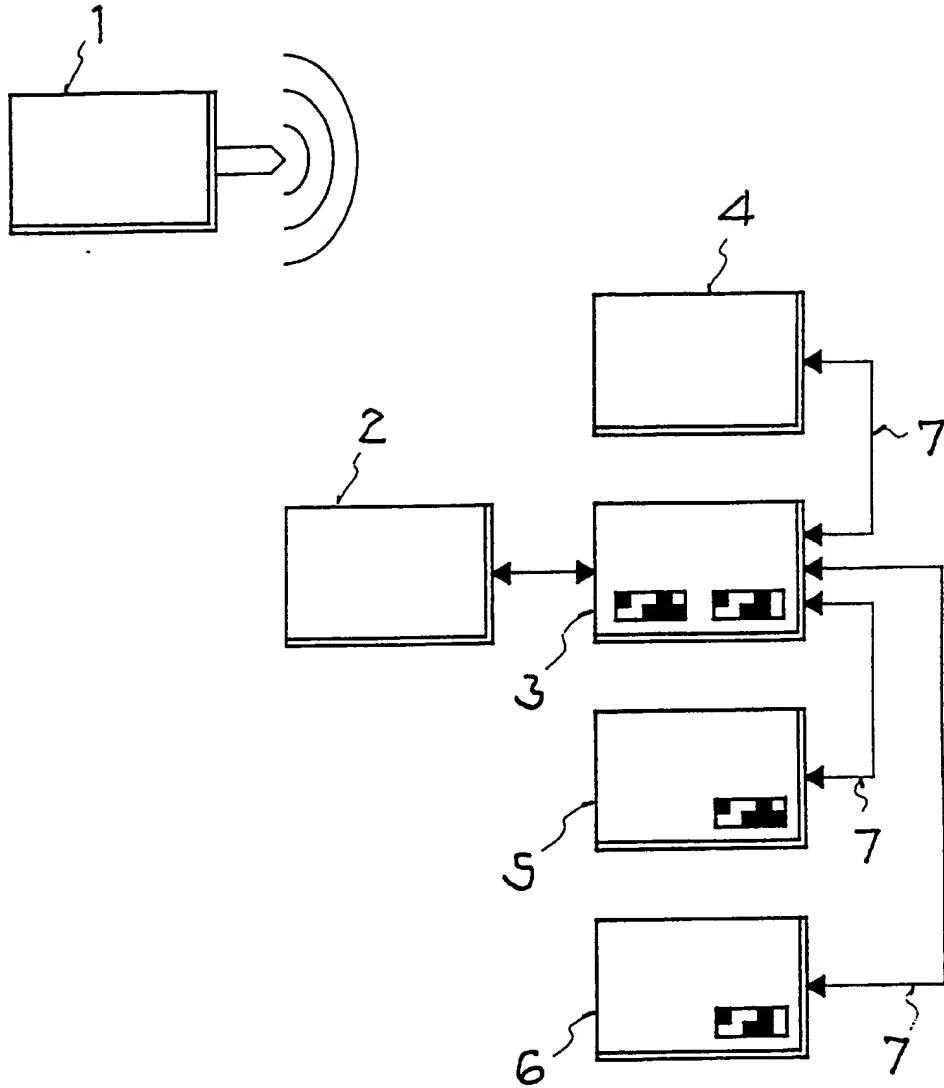


FIG.1

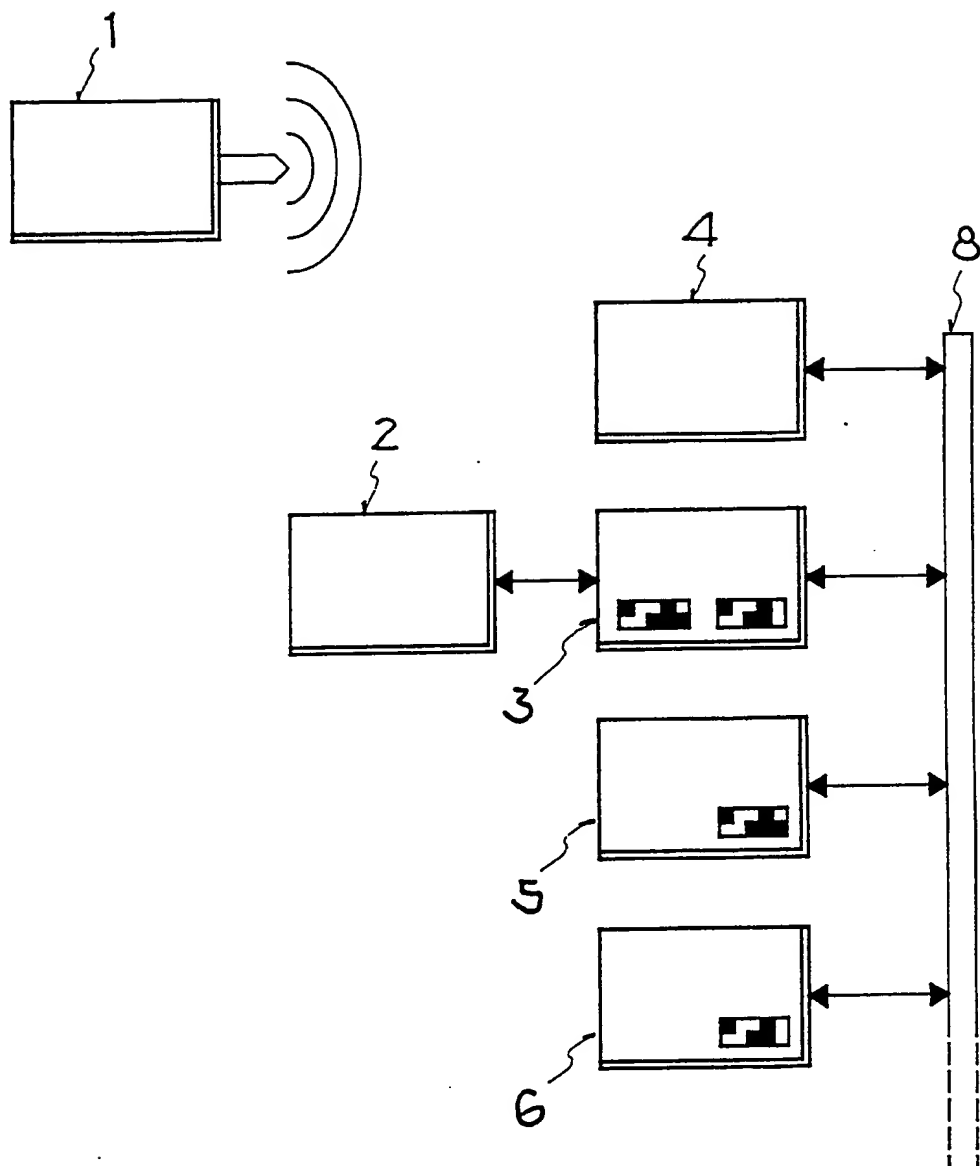


FIG. 2

Operation of an alarm system

5 The invention relates to the operation of an alarm system, and more particularly to the operation of an alarm system which is for motor vehicles and which comprises a central controller connected to a plurality of further controllers. A method of operating a system of this kind is known from EP 0 105 774.

10

Motor vehicles are usually protected against theft by alarm systems that monitor door contacts, current loops and the vehicle interior. In the case of an alarm, a central controller, i.e. the alarm control
15 centre, either causes operation of signalling devices such as horn, warning signal flashers or headlamp flashers (passive methods) or ensures that start-up of the motor vehicle is prevented by the starting of the vehicle or the engine control system being
20 blocked (active methods). However, effective protection of the vehicles against theft cannot be achieved by the above-mentioned passive and active alarm methods, since all alarm effects can easily be cancelled by deactivation or switching off of the
25 alarm system, in particular by professional car thieves.

30

In the case of EP 0 105 774 mentioned above, the alarm system possesses a central controller which is connected unidirectionally to various control units of the motor vehicle and is mounted inaccessibly in the motor vehicle (for example in the engine gearbox unit, in the gear casing or in the vehicle chassis); since the central controller may be removed and
35 replaced only at great expense, relatively good but expensive protection against theft is ensured.

The present invention seeks to provide a method by which thefts of motor vehicles may be prevented permanently and without major expenditure.

5 According to a first aspect of the present invention, there is provided a method for the operation of an alarm system for a motor vehicle, which comprises a central controller connected to a plurality of
10 further controllers wherein all the non-safety-related controllers of the motor vehicle are connected bidirectionally to the central controller of the alarm system, a particular code for the respective activation state of the alarm system is stored in the non-safety-related controllers and may
15 be read out there, on replacement of a controller the new controller is, on start-up of the vehicle, activated in the original sense by the controllers not replaced, and if the alarm system is deactivated improperly at least some of the non-safety-related
20 controllers are deactivated or influenced negatively as regards their mode of operation.

According to a second aspect of the present invention there is provided an alarm system for a motor vehicle
25 having a plurality of function controllers, the arrangement being such that, upon improper deactivation of the alarm system, one or more of the function controllers are wholly or partially disabled, either permanently or until proper
30 deactivation of the alarm system occurs.

According to a third aspect of the present invention there is provided an alarm system for a motor vehicle having a plurality of function controllers, the alarm
35 system comprising a central controller connected bidirectionally to at least some of the function

controllers whereby coded information may be exchanged, the arrangement being such that, upon replacement of one or more of the controllers, the coded information stored in the system before replacement is supplied to the newly installed controller(s) by the remaining controller(s), and that, upon improper deactivation of the alarm system, one or more of the function controllers are wholly or partially disabled.

10 In preferred embodiments, all non-safety-related controllers of the motor vehicle are either connected bidirectionally individually on their own to the central controller of the alarm control centre or are
15 coupled via a bus system bidirectionally with one another and with the central controller. In the controllers the information on the activation state of the alarm system is stored in coded form and may be read out there at any time. Each controller may
20 pass said information to other controllers, so that all the controllers are always in the same activation state; particularly in the event of the replacement of the central controller or of one or more of the non-safety-related controllers, the new controller or
25 the new controllers is/are activated again in the original sense by the controllers not replaced. The coded information on the activation state which is stored in the controllers may be read out at each controller and/or a diagnostic connector; in the case
30 of an improperly deactivated alarm system, the vehicle is immediately identified as stolen during checks or during visits to garages. In the case of an improperly deactivated alarm system the use of some, or with advantage all, of the non-safety-related controllers is prevented or made difficult on
35 the start-up of the motor vehicle, so that the latter

do not exercise their function at all or exercise it only incompletely or significantly worse. This is particularly effective in the case of controllers which provide the driver with a particular luxury feature (for example window winders, seat adjustment, air-conditioning etc.), which supply items of information (multi-purpose instrument) or which offer additional safety features (ABS, airbag). Safety-related interventions on engine, gears and brakes are not envisaged, but the engine control or timing may for example be influenced so that acceleration performance and/or fuel consumption deteriorate noticeably. In particular any legally permitted form of intervention should be undertaken so that the expenditure on correcting the faults (achievable only by replacement of all the controllers) becomes as great as possible.

In contrast to most of the traditional alarm systems (acoustic or optical alarm, prevention of the vehicle starting) the protective function in the present alarm system consists in the fact that the value in use of a stolen vehicle is permanently reduced, that impermissible deactivation of the alarm system may be countered only by replacement of all the controllers and the central controller (vast expenditure), and that it is checkable and recognisable unambiguously whether the vehicle has been stolen. This has a deterrent effect on car thieves and is therefore able to contribute significantly to reducing the number of car thefts.

Preferred embodiments of the present invention will now be described, by way of example only, with reference to the accompanying drawings, of which:

Figure 1 shows a schematic representation an alarm system with a plurality of coded individual controllers; and

5 Figure 2 shows an alarm system with a plurality of coded controllers connected via a bus system.

According to Figure 1 the alarm control centre or central controller of the alarm system is connected
10 via individual leads 7 bidirectionally to the controllers 5,6 and to an additional controller 4 for emergency deactivation. According to Figure 2 there is provided for the bidirectional coupling of the individual controllers 5,6, the alarm control centre
15 3 and the additional controller 4, a bus system 8 which links the above-mentioned controllers with one another. If the vehicle is started up and the alarm system deactivated improperly, the controllers 5,6 are seriously affected as regards their operability or rendered fully inoperable via the alarm control
20 centre 3. Operability is restored only on proper deactivation of the alarm control centre 3 or by replacement of all the controllers 3,5,6. The controllers 5,6 possess a storage element (for example an EEPROM) in which a particular code for the deactivated or activated state is stored; the
25 respective activation state may be read out at the controllers or by means of a diagnostic unit at any time. It is ensured by the bidirectional linking of the controllers 5,6 with the alarm control centre 3 that all the controllers 3,5,6 are able to exchange information among themselves and are affected as regards their mode of operation simultaneously or, in the event of replacement of one of the controllers,
30 store the original activation state in the new controller.
35

The alarm system is activated and deactivated by means of a remote control system with transmitter 1 and receiver 2 and is therefore unable to be switched off by mechanical manipulations on the vehicle. In
5 emergency cases the vehicle is unlocked mechanically and the alarm system or the alarm control centre 3 deactivated via the additional controller 4 or a control panel (for example a keyboard with secret
10 number or a complicated sequence of switching operations).

Claims

1. A method for the operation of an alarm system for a motor vehicle, which comprises a central controller connected to a plurality of further controllers wherein all the non-safety-related controllers of the motor vehicle are connected bidirectionally to the central controller of the alarm system, a particular code for the respective activation state of the alarm system is stored in the non-safety-related controllers and may be read out there, on replacement of a controller the new controller is, on start-up of the vehicle, activated in the original sense by the controllers not replaced, and if the alarm system is deactivated improperly at least some of the non-safety-related controllers are deactivated or influenced negatively as regards their mode of operation.
2. A method according to claim 1, wherein the non-safety-related controllers are connected to the central controller via separate leads.
3. A method according to claim 1, wherein the non-safety-related controllers are connected to the central controller via a bus system.
4. A method according to any preceding claim, wherein the alarm system is activated and deactivated via remote control between a transmitter and a receiver which is connected to the central controller.
5. A method according to any preceding claim, wherein the central controller may be deactivated via an additional controller in case of emergency.

6. A method for the operation of an alarm system substantially as herein described with reference to Fig.1 or Fig.2 of the accompanying drawings.

5 7. An alarm system for a motor vehicle having a plurality of function controllers, the arrangement being such that, upon improper deactivation of the alarm system, one or more of the function controllers are wholly or partially disabled, either permanently
10 or until proper deactivation of the alarm system occurs.

8. An alarm system according to claim 7 and comprising a central controller connected
15 bidirectionally to the other controller whereby coded information may be exchanged, the arrangement being such that, upon replacement of one or more of the controllers, the coded information stored in the system before replacement is supplied to the newly
20 installed controller(s) by the remaining controller(s).

9. An alarm system for a motor vehicle having a plurality of function controllers, the alarm system
25 comprising a central controller connected bidirectionally to at least some of the function controllers whereby coded information may be exchanged, the arrangement being such that, upon replacement of one or more of the controllers, the
30 coded information stored in the system before replacement is supplied to the newly installed controller(s) by the remaining controller(s), and that, upon improper deactivation of the alarm system, one or more of the function controllers are wholly or
35 partially disabled.

10. An alarm system according to any of claims 7 to 9, wherein the function controllers which are disabled do not relate to safety functions of the motor vehicle.

5

11. An alarm system according to any of claims 7 to 10, wherein the alarm system is activated and deactivated via remote control between a transmitter and a receiver which is connected to the central controller.

10

12. An alarm system according to any of claims 7 to 11, wherein the central controller may be deactivated via an additional controller in case of emergency.

15

13. An alarm system substantially as herein described with reference to Fig.1 or Fig.2 of the accompanying drawings.

20

14. A motor vehicle incorporating an alarm system according to any of claims 7 to 13.

Relevant Technical Fields

- (i) UK Cl (Ed.L) G4H (HTG)
 (ii) Int Cl (Ed.5) B60R 25/00, 25/10

Databases (see below)

- (i) UK Patent Office collections of GB, EP, WO and US patent specifications.

(ii)

Search Examiner
 M J DAVIS

Date of completion of Search
 8 NOVEMBER 1993

Documents considered relevant
 following a search in respect of
 Claims :-
 1-14

Categories of documents

- X: Document indicating lack of novelty or of inventive step. P: Document published on or after the declared priority date but before the filing date of the present application.
- Y: Document indicating lack of inventive step if combined with one or more other documents of the same category. E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.
- A: Document indicating technological background and/or state of the art. &: Member of the same patent family; corresponding document.

Category	Identity of document and relevant passages	Relevant to claim(s)
X	GB 2251503 A (INTELEPLEX) whole document	7,10,11
X,P	WO 93/05987 A1 (FORD) whole document	7,10

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